



MILLET BASED HEALTH MIX WITH SARACA INDICA

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ABSTRACT

Saraca indica (Caesalpinaceae) is one of the most ancient tree in India, known as "Ashoka" means without sorrow. The Ashoka bark powder used as traditional and ayurvedic medicine. The present study was aimed to formulate, analyse and evaluate the saraca indica incorporated health mix with Italian millet and kodo millet flour in three variations as V1 (15,15,30), V2 (20,20,20), V3 (25,25,10) whereas roasted green gram dhal powder 40% kept constant. The most accepted variation V3 was selected for further analysis of physio-chemical, nutritional, nanoparticles, storage stability. Nutrient analysis of energy was 395.84kcal, carbohydrate 77.25g, fat 2.84g, protein 13.9g fiber 2.76gm, calcium 138mg, iron 6.41mg and silver nanoparticle was synthesized. Storage stability was found to be 30 days without preservative. The consumer acceptance of the health mix is higher than the commercial health mix. The formulated health mix was rich in calcium, iron and beneficial for Polycystic Ovary Syndrome (PCOS) and infertility.

KEYWORDS : Millets, saraca indica, health mix, PCOS

INTRODUCTION

As a medicinal tree the utility of ashoka seems to have been a recognised first in the Agnivesa Caraka Samhita which is supposed to have been compiled somewhere near 1000 B.C. Ayurvedic physicians of the present century use ashoka to cure uterine infections. *Saraca indica* in Ayurvedic medicine used as hypothermic, diuretic and as a blood purifier. It is also used to treat bleeding piles, bacillary dysentery, Asokarista, asokaghrita, asoka decoction and asoka pills are the famous pharmaceutical preparations. The drug Asoka Arista is traditionally used in India and Sri Lanka to treat menorrhagia.

The bark of *Saraca indica* contains an estrogenic compound called ergo sterol. Flavonoids, terpenoid, lignin, cardiac glycosides, phenolic compounds, tannins, were the major constituents present in the *Saraca asoca* stem bark extracts. The isolation of flavonoids and leucoanthocyanidins were previously reported from the bark. These phytoconstituents are responsible for various pharmacological actions of this plant part, like antiulcer, anticancer and chemo protective activities (Suja et al, 2012). The bark has a stimulating effect on the endometrium and ovarian tissue and is useful in menorrhagia during uterine fibroids. It also has great benefits for its uterine activity (Satyavati et al, 1970)

The anticancer principle from *Saraca indica* flowers indicated 50 percent cytotoxicity (in vitro) in Dalton's lymphoma ascites and Sarcoma-180 tumour cells at a concentration of 38 mug and 54 mug respectively, with no activity against normal lymphocytes but preferential activity for lymphocytes derived from leukemia patients (Mathew et al, 2009)

PCOS is a heterogeneous disorder that affects at least 7% of adult women. According to the National Institute of Health Office of Disease Prevention, PCOS affects approximately 5 million women of child bearing age. Research suggests that 5-10% of females at 18 to 44 years of age are affected by PCOS making it the most common endocrine abnormality among women of reproductive age (Anadu U et al, 2013)

Based on all these aspects, the present study was intended to develop an millet based health mix with saraca indica for PCOD women and girls; also in uterine disorder, infertility to nourish and satisfy their nutrient requirement apart from their routine diets. The study was carried out with the objectives as to formulate, analyse and evaluate the saraca indica incorporated health mix.

METHODOLOGY

Sathamavu, Multigrain powder, Mixed Millets Flour, Healthy

mix powder, Millets energy powder, Millets drink, Ragi health mix, Multi Millets powder are the one and only incredible Health mix recipe with combinations of perfect proportions of millets to make one energy mix powder or Sathu maavu as it is traditionally known as. Health mix is formulated by using saraca indica bark powder, Italian millet flour, kodo millet flour, roasted moong dhal flour and cane sugar. These ingredients were purchased in the local wholesale market and processed (cleaned, dried and powdered finely). Drying of medicinal herb/spice materials help to keep them for future cooking as well as reduce the risk of bacterial or fungal contamination. Since many herbs are used in the dried form, drying process may affect their phytochemical content and radical scavenging activity, therefore, it is necessary to determine the best method of drying to maintain or enhance the radical scavenging activity and phytochemical content (Bernard et al., 2014).

The saraca indica bark powder incorporated health mix was developed in to three variations as V1 (15,15,30), V2 (20,20,20), V3 (25,25,10) whereas roasted green gram dhal powder 40% were kept constant and cane sugar was added as 1:1 ratio. To ensure the acceptability of the modified recipes, they were subjected to evaluation by composite scoring for their sensory qualities. The selected sample is subjected to nutrient analysis as energy, carbohydrate, protein, fat, fiber and minerals like calcium and iron. Green synthesis of silver nanoparticles using aqueous extract of saraca indica health mix was analyzed.

Health mix is one of the dehydrated products which are preserved by drying method. The storage stability of the selected sample was ascertained by storing in an air tight container for initial and final after 30 days of the storage. The selected sample drawn at an interval of 0, 15,30 days were evaluated for appearance, color, flavor, taste, texture, overall acceptability and quality of flour for a period of 1 months.

Microbial testing is essential for food processing to ensure safety and quality. Microbial analysis is used to identify the bacteria, fungi, moulds and other microbial growth. Hence Microbial counts were analyzed in the initial and final i.e. after 30 days of the study period. Microbial counts were analyzed in the initial and final as after 30 days from the study period. Consumer acceptability of health mix is carried out by 30 women consumers with 5 point hedonic scale.

RESULTS & DISCUSSION

The results pertaining to study were discussed as organoleptic evaluation, physio-chemical properties, nutritional and

nanoparticles analysis, storage stability and consumer acceptance.

Organoleptic evaluation:

For assessing the acceptability of new developed products organoleptic or sensory evaluation is essential. Here it was done by 25 semi-trained panel members using a 5-point hedonic scale. The mean score of three variations in saraca indica health mix is given in the below table

Table-I

Mean score of three variations in saraca indica health mix

Criteria	variation 1 (V1)	variation 2 (V2)	variation 3 (V3)
Appearance	3.92±0.75	4.36±0.62	4.4±0.71
Color	4.4±0.70	4.4±0.57	4.36±0.86
Flavour	3.68±0.69	4.16±0.85	4.24±0.72
Texture	4.4±1.0	4.56±0.91	4.72±0.45
Taste	3.5±0.65	4.24±0.72	4.24±0.72
overall acceptability	3.72±0.45	4.24±0.59	4.28±0.67

From the above table it was clear that the variation 3 shows the highest scores of all sensory attributes viz., appearance, colour, flavour, texture, taste, overall acceptability when compared with variation 1 and 2.

Phiso- chemical analysis

Temperature and time used in the drying techniques could be the main contributing factor in the degradation. The loss of macromolecules like phytochemicals during heat treatment might be due to the harsh drying conditions, in particular, the temperature and duration used. Degradation of phytochemicals upon thermal treatment of broccoli florets had been reported (Zhang et al., 2004).

The moisture and ash content of the selected sample of variation 3 were 3.75% and 2.26% respectively. The low moisture content indicates the good shelf life. The bulk density and swelling index of instant herbal health mix analysed was 0.76g/cm³ and 0.9% respectively.

Nutrient analysis

Nutrient composition of variation-3 was analyzed for the essential nutrients such as energy, carbohydrate, fat, protein, calcium and iron. The results were displayed in the table below.

Table 2

Nutrient content of saraca indica health mix

S.No	Criteria	Nutrient value / 100g
1	Energy(kcal)	395.84
2	Carbohydrate(g)	77.25
3	Fat(g)	2.84
4	Protein(g)	13.9
5	Fiber(g)	2.76
6	Calcium(g)	138
7	Iron(g)	6.41

The above table depicts the analyzed nutritive values per 100g of sample. The energy content was 395.84kcal, carbohydrate, fat, protein and fiber were 77.25g, 2.84g, 13.9g, 2.76g respectively. The minerals calcium and iron were 138mg and 6.41mg.

Nanoparticle analysis

The green synthesis of silver nanoparticles using aqueous extract of saraca indica health mix was analyzed in laboratory; the color changes of pale yellow to brown color indicates the presence of silver nanoparticles (AgNps) due to the reduction of silver ions

Storage stability

Storage stability is essential for the shelf life of food products. It was found that the microbial growth occurred in the storage period of 30 days in the sample without preservative. The microbial growth in instant health mix was 2cfu respectively. One month was the better shelf life period for the selected sample without preservative.

Cost effectiveness

The cost of formulated instant health mix was calculated by computing the cost of the ingredients. It was found that the cost of 100g of the formulated health mix was Rs.50. The formulated instant health mix was much low and affordable for all population.

Consumer acceptance

The consumer acceptance was done for the sample of formulated health mix compared with the commercially available health mix among 30 members in Dharapuram. It was found that among the 30 members 22 reported they like extremely the saraca indica health mix and 10 members like extremely the commercial herbal health mix, six members like slightly of saraca indica health mix and 18 members like slightly the commercial health mix. And two members of each were neither like or dislike in saraca indica health mix and commercial health mix. And none of them were dislike slightly and dislike extremely.

CONCLUSION

The health drink or porridge prepared from health mix could be aptly consumed by toddlers to adults and old people of 60 years of age. Health Mix or Sathu Mavu, an Indian Traditional Food for babies acts as an Immunity Booster and weight gain. Saraca indica is one of the most leading plants utilized from ancient times till to date. The formulated milled based saraca indica health mix was effective of PCOD condition and infertility, these are rich in calcium, iron and it contain silver nanoparticle which act as antibiotic agent.

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